

**Abstract of the Disclosure**

Three-dimensional data that is processed is divided by the number of threads in the third dimensional direction and stored to respective secondary cache memories of the threads. Each thread Fourier transforms data stored in the secondary cache in the first dimensional direction and the second dimensional direction. As a result, a two-dimensional Fourier transform can be performed in parallel at a time. The resultant data that has been two-dimensionally transformed is restored to a shared memory. Each thread Fourier transforms the data in the third dimensional direction.